



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**Applicant : TAKAAKI KUTSUNA, ET. AL.**

**Serial No. : 10/9602,637**

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**For : FUEL SYSTEM HAVING EXCELLENT GASOLINE BARRIER  
PROPERTY**

**Art Unit & Examiner: 1794, PATTERSON, MARC A**

**DECLARATION UNDER 37 C.F.R. 1.132**

**Honorable Commissioner of Patents and Trademarks  
Washington, D.C. 20231**

**Sir:**

**Now comes Shinichi YONEHAMA who deposes and states:**

- 1. That I am a graduate of Kanazawa University and (received master degree of Engineering in the year of 1993. )**
- 2. That I have been employed by Mitsubishi Gas Chemical Company Inc. of 5-2, Marunouchi 2-chome, Chiyoda-ku, Tokyo 100-8324, Japan for years since 1993 as a researcher in the field of Polymer.**
- 3. That I have a good knowledge of the English language and have read and understood the application papers and the Examiner's Official Action as well as the reference cited therein in the prosecution of the above identified patent application; and**
- 4. The following experiments were carried out by me.**

**Additional Comparative Examples**

- 1. Curing agent of Tashiro et al was prepared according to Example 1 of US3,704,229.**

**2. Additional Comparative Example 1**

**Prepared was a methanol/ethyl acetate = 1 : 1 solution (solid matter**

concentration: 30 % by weight) containing 40 parts by weight of the above curing agent and 60 parts by weight of an epoxy resin Epikote 828 (Shell) and stirred well to obtain a coating liquid. This coating liquid was coated on high density polyethylene (HDPE) having a thickness of 100  $\mu\text{m}$  by means of a bar coater No. 24 and dried at 120°C for 10 minutes, and then it was further cured at 180°C for 10 minutes, whereby a coated film was obtained. The coating layer had a thickness of 10  $\mu\text{m}$ . A gasoline permeability coefficient of the coated film thus obtained was determined. The result thereof is shown in Table A.

### 3. Additional Comparative Example 2

According to Example 4, an acrylonitrile-butadiene rubber was molded into a tube having an inner diameter of 24 mm and a thickness of 5 mm, and this was cut to a length of 500 mm to obtain a tube body.

Prepared was a methanol/ethyl acetate = 1 : 1 solution (solid matter concentration: 30 % by weight) containing 40 parts by weight of the above curing agent and 60 parts by weight of an epoxy resin Epikote 828 (Shell) and stirred well to obtain a resin solution.

One end face of the tube body described above was sealed with an aluminum matter (aluminum-deposited film), and the resin solution was filled into the tube body and immediately discharged, whereby the resin solution was coated onto the inner face of the tube body. After discharging the resin solution, the aluminum matter was detached from the end face of the tube body, and the resin solution was cured at 80°C for 10 minutes and

then at 120°C for 10 minutes to form a coating layer. The coating layer had a thickness of 10  $\mu\text{m}$ . The tube in which the coating layer was formed was evaluated for a gasoline barrier property and a gasoline barrier property after bending (a gasoline permeability coefficient of the coating layer, a gasoline permeability of the tube and a gasoline permeability of the tube after the bending treatment (10 times)). The results thereof are shown in Table A.

**Table A**

Comparison of results of Additional Comparative Examples with those of Example 1 and 4 of the present invention

	thickness of coating layer	Gasoline permeability coefficient	Gasoline permeability coefficient of layer	Gasoline permeability of tube	Gasoline permeability of tube after bending
	$\mu\text{m}$	$\text{g}\cdot\text{mm}/\text{m}^2\cdot\text{day}$	$\text{g}\cdot\text{mm}/\text{m}^2\cdot\text{day}$	$\text{g}/\text{m}^2\cdot\text{day}$	$\text{g}/\text{m}^2\cdot\text{day}$
Example 1	10	0.006			
Example 4	10		0.010	1.0	1.1
Additional Comparative Example 1	10	0.25			
Additional Comparative Example 2	10		0.42	33	94

I declare further that all statements made herein of my own

knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Shinichi Yonehama  
Shinichi YONEHAMA

August 11, 2008  
Date